IGNITION/GLOW PLUG SYSTEM

IGNITION SYSTEM, SERVICING

General notes on ignition system

NOTE:

- **Only the components which specifically relate to the ignition system are dealt with here. For the other components of the fuel injection system, see MULTIPORT FUEL INJECTION (MFI) .**
- **The Engine Control Module is equipped with On Board Diagnostic (OBD).**
- **Components marked with * are checked via the On Board Diagnostic (OBD), see DTC MEMORY OF MOTRONIC ENGINE CONTROL MODULE (ECM) -J220-, CHECKING AND ERASING .**
- **For trouble -free operation of the electrical components a voltage of at least 11.5 V is necessary.**
- **During some checks it is possible that the control module will recognize and store a DTC. Therefore after completing all checks and repairs the DTC memory must be checked and if necessary erased, see DTC MEMORY OF MOTRONIC ENGINE CONTROL MODULE (ECM) -J220-, CHECKING AND ERASING .**

Safety precautions, see **SAFETY PRECAUTIONS**

Test data, spark plugs, see **TEST DATA, SPARK PLUGS**

Ignition system components, removing and installing

NOTE:

- **Engine Control Module with connectors, see FUEL INJECTION SYSTEM COMPONENTS, REMOVING AND INSTALLING , item 6.**
- **Components marked with * are checked via the On Board Diagnostic (OBD), see DTC MEMORY OF MOTRONIC ENGINE CONTROL MODULE (ECM) -J220-, CHECKING AND ERASING .**

The following list pertains to **Fig. 1** .

1. **Connector**
   - Black, 4 pin
2. **Ignition coils with power output stages (-N70-, -N127-, -N291-, -N292-)**
   - Checking, see **IGNITION COILS WITH POWER OUTPUT STAGE, CHECKING**

- For removing use only removal tool T40039, see **IGNITION COILS WITH POWER OUTPUT STAGE, CHECKING**

3. **Circlip**
   - For ignition coil with power output stage (-N70-, -N127-, -N291-, -N292-)
   - Replace if damaged
4. **Spark plug, 30 Nm**
   - Remove and install with spark plug wrench 3122B
   - Type and electrode gap, see **TEST DATA, SPARK PLUGS**
5. **Connector**
   - Black, 3-pin
   - For Camshaft Position (CMP) sensor -G40-
   - Sensor and connector terminals are gold-plated
6. **Bolt, 10 Nm**
7. **Camshaft Position (CMP) sensor - G40-***
   - Component location, see **COMPONENT LOCATIONS, OVERVIEW** , engine compartment overview
   - Checking, see **CAMSHAFT POSITION (CMP) SENSOR -G40-, CHECKING**
8. **Bolt, 25 Nm**
9. **Washer**
   - Conical
10. **Hood**
    - For Camshaft Position (CMP) sensor -G40-
    - When installing note fixing arrangement
11. **Bolt, 20 Nm**
    - Tightening torque influences the function of the Knock Sensor (KS)
12. **Knock Sensor (KS) (KS) 1 -G61-***
    - Sensor and connector terminals are gold-plated
    - Component location: Cylinder block intake side
    - Checking, see **KNOCK SENSORS (KS), CHECKING**
13. **Knock Sensor (KS) 2 -G66-***
    - Sensor and connector terminals are gold-plated
    - Component location: Cylinder block intake side
    - Checking, see **KNOCK SENSORS (KS), CHECKING**
14. **Connector**
    - 2-pin
    - For Knock Sensor (KS) 1 -G61-
    - Sensor and connector terminals are gold-plated
    - Black for Knock Sensor (KS) 1 -G61-

- Black for Knock Sensor (KS) 2 -G66-
- Mark connector before removing

15. **Ground (GND) wire**
    - Only loosen or tighten with ignition switched off
16. **Bolt, 10 Nm**
    - Only loosen or tighten with ignition switched off

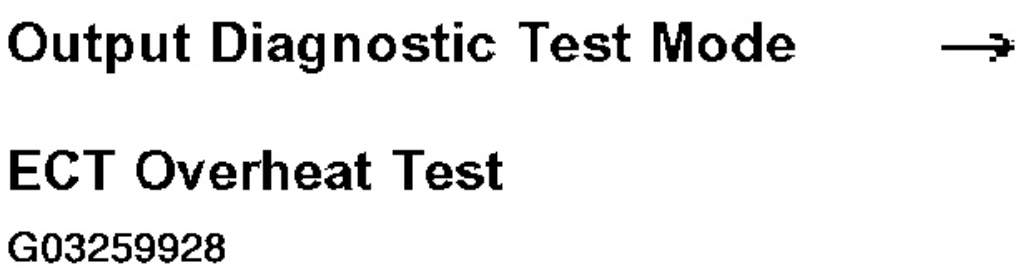

Fig. 1: Identifying Ignition System Components
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Safety precautions

To prevent injuries to persons and/or damage to the fuel injection and ignition system, the following must be noted:

WARNING: When doing any repair work, especially in the engine compartment, due to the cramped conditions, pay attention to the following:

- **Route all sorts of lines (e.g. for fuel, hydraulics, EVAP system, coolant, refrigerant, brake fluid and vacuum lines and hoses) and electrical wiring so that the original positions are restored.**
- **Ensure sufficient clearance to all moving or hot components.**

- Do not touch or disconnect ignition wiring when the engine is running or being turned at starter speed.
- The ignition must be switched off before connecting or disconnecting injection or ignition system wiring or tester cables.
- If the engine is to be turned at starter speed, without starting, e.g. when checking compressions, pull connector off output stage:

- Disconnect all 4 -pin connectors -2- from ignition coils with power output stage -1-.

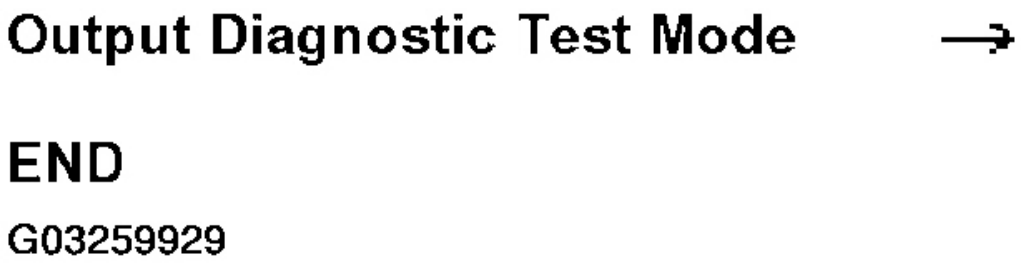

Fig. 2: Disconnecting All Pin Connectors From Ignition Coils
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Pull fuse No. 32 out of fuse holder.

NOTE: Removing fuse 32 interrupts the voltage supply to the fuel injectors. Fuse holder is located behind access panel at far left end of dash.

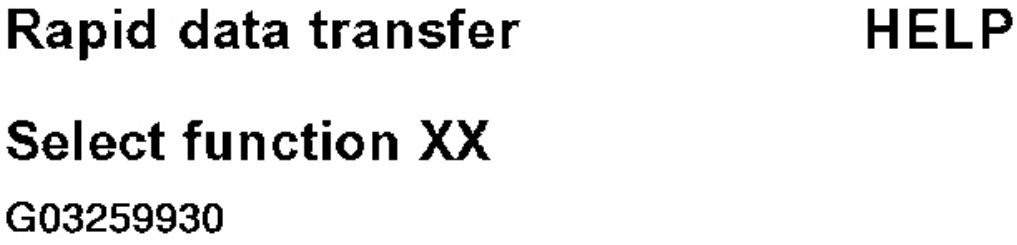

Fig. 3: Locating Fuse 32
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Observe following if test and measuring instruments are required during a road test:

WARNING:

- **When driving or riding in an airbag -equipped vehicle, NEVER hold the scan tool or other test equipment in your hands or lap while in motion. Objects between you and the airbag increase the risk of injury in an accident.**
- **During a road test in an airbag -equipped vehicle, test equipment**

must always be fastened to and operated from the rear seat by a second technician.

Test data, spark plugs

TEST DATA, SPARK PLUGS

Engine code	**AWP**	**AWV**
Firing order	1-3-4-2	1-3-4-2
Spark plugs(1) , (2)		
VW/Audi	101 000 063 AA	101 000 063 AA
Manufacturer ID	NGK PFR 6 Q	NGK PFR 6 Q
Electrode gap	max. 0.8 mm	max. 0.8 mm
Tightening torque	30 Nm	30 Nm
(1) The up-to -date figures and the spark plug change intervals:		
(2) Remove and install spark plugs with 3122B and appropriate extension.		

See **MAINTENANCE**

Camshaft Position (CMP) sensor -G40-, checking

Special tools, test equipment and auxiliary items

- V.A.G 1598/31 test box
- V.A.G 1526 A or Fluke 83 multimeter
- V.A.G 1594 C adapter set
- Electrical Wiring Diagrams

Test conditions

- Camshaft Position (CMP) sensor -G40- installed tightly
- Battery voltage must be at least 11.5 V

Test sequence

- Disconnect 3-pin connector from Camshaft Position (CMP) sensor -arrow-.

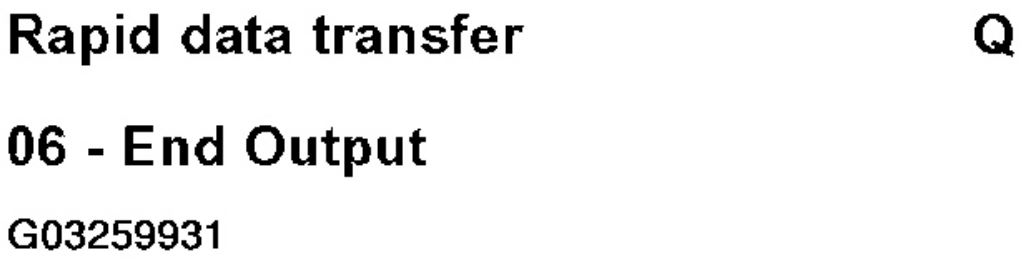

Fig. 4: Disconnecting 3-Pin Connector From Camshaft Position (CMP) Sensor
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Connect multimeter to measure voltage with adapter cables from V.A.G 1594 C to terminals 1 (positive) and 3 (Ground) on Camshaft Position (CMP) sensor connector.

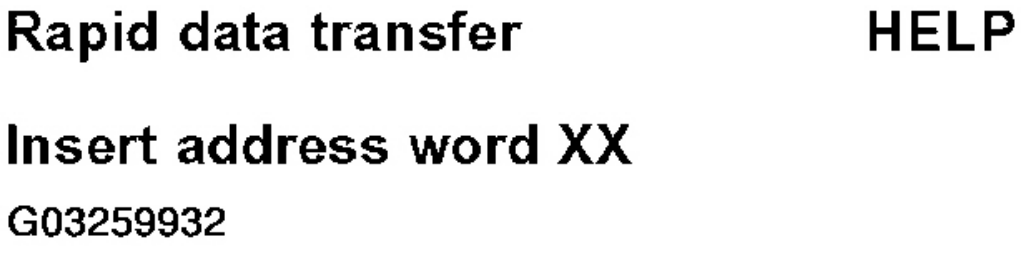

Fig. 5: Connecting Multimeter To Terminals 1 And 3 Of CMP Sensor Harness Connector Terminals
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Switch on ignition.

  Specification: min. 4.5 V

- Switch off ignition.

  If no voltage is present:

- Remove inner plenum chamber cover, left:

See **PLENUM CHAMBER INNER COVER, REMOVING AND INSTALLING**

- Connect V.A.G 1598/31 test box to control module wiring harness. Engine Control Module is not connected by this action.

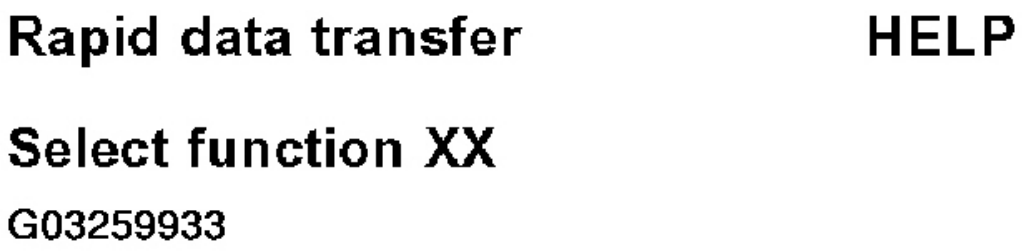

Fig. 6: Connecting V.A.G 1598/31 Test Box To Control Module Wiring Harness
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Check wiring for open circuit between test box and connector using Electrical Wiring Diagrams.

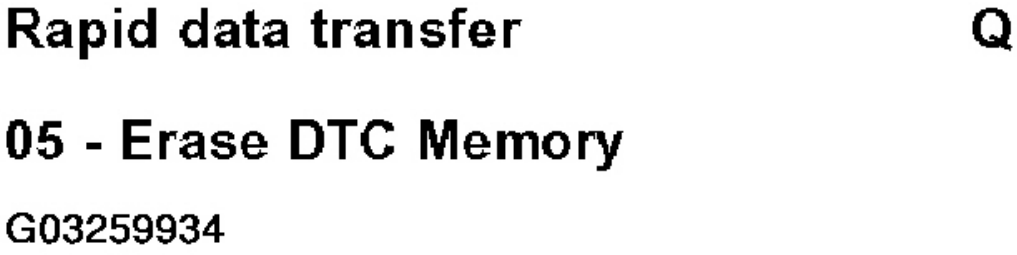

Fig. 7: Identifying CMP Sensor Harness Connector Terminals
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Contact 1 + socket 98
- Contact 2 + socket 86
- Contact 3 + socket 108

Wire resistance: Max. 1.5 ohm

- Additionally check wires for short to one another.

  Specification: ohm

  If no malfunctions in wiring are detected and voltage was present between terminals 1 + 3:

- Replace Camshaft Position (CMP) sensor -G40-, see item 7 .
- Check DTC Memory, if necessary, repair any malfunctions and then Erase DTC Memory, see **DTC MEMORY OF MOTRONIC ENGINE CONTROL MODULE (ECM) -J220-, CHECKING AND ERASING** .
- Read readiness code, see **READINESS CODE, DISPLAYING** . If DTC memory has been erased or Engine Control Module was disconnected from battery positive, readiness code must be generated again, see **READINESS CODE, GENERATING** .

  If no malfunction in wiring is detected and no voltage was present between terminals 1 + 3:

- Replace Engine Control Module, see **MOTRONIC ENGINE CONTROL MODULE (ECM) - J220-, REPLACING** .

Ignition coils with power output stage, checking

Special tools, test equipment and auxiliary items

- V.A.G 1598/31 test box
- V.A.G 1526 A or Fluke 83 multimeter
- V.A.G 1527 B voltage tester
- V.A.G 1594 C adapter set
- Removal tool T40039
- Electrical Wiring Diagrams

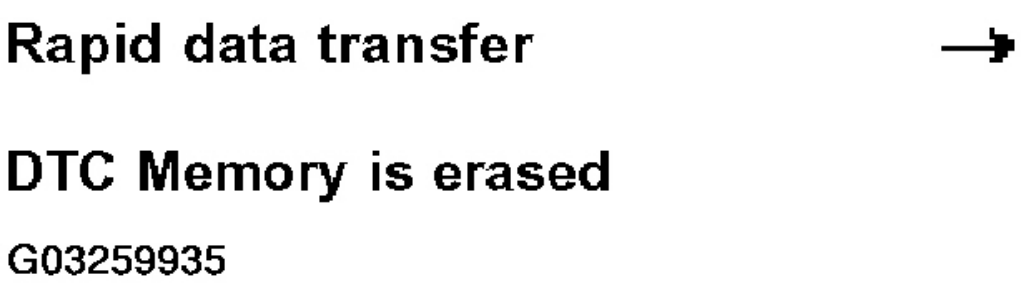

Fig. 8: Identifying Special Tools

Courtesy of VOLKSWAGEN OF AMERICA, INC.

Test conditions

- All fuses must be OK. Fuse holder is located behind access panel at far left end of dash.

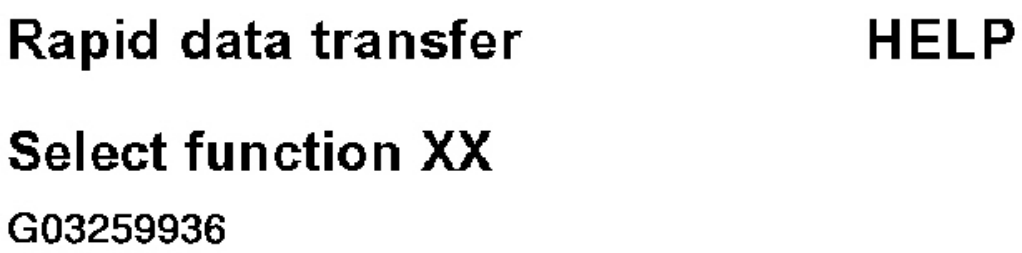

Fig. 9: Locating Fuses
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Battery voltage must be at least 11.5 V
- Camshaft Position (CMP) sensor -G40- must be OK, checking, see **CAMSHAFT POSITION (CMP) SENSOR -G40-, CHECKING**
- Engine speed (RPM) sensor must be OK, checking, see **ENGINE SPEED (RPM) SENSOR, CHECKING**

NOTE: Ignition coils and power output stages are one component and cannot be replaced individually.

Test sequence

- Disconnect 4-pin connector -2- from ignition coil with power output stage to be checked -1-..

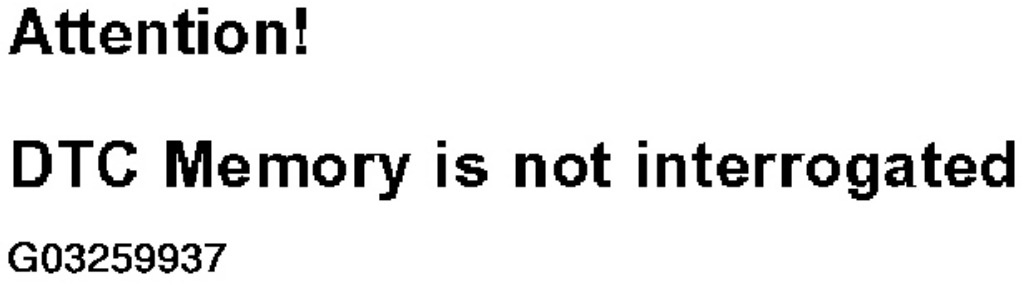

Fig. 10: Disconnecting 4-Pin Connector From Ignition Coil
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Checking voltage supply

- Using multimeter and adapter cables from V.A.G 1594 C measure supply voltage between terminals 1 + 2 and 1 + 4 of disconnected connector.

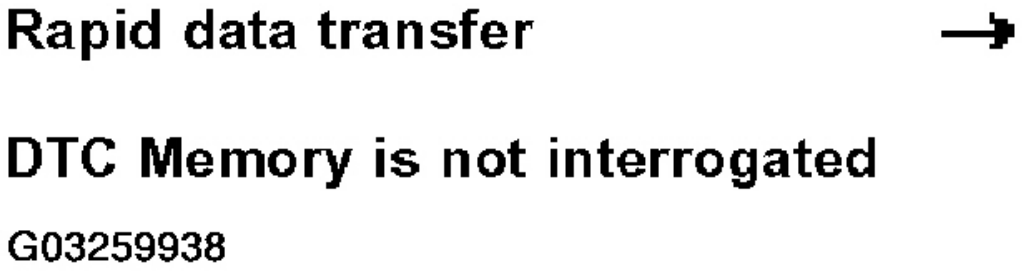

Fig. 11: Identifying Ignition Coil 4-Pin Harness Connector Terminals
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Switch on ignition.

  Specification: Min. 11.5 V

- Switch off ignition.

If no voltage is present:

- Check wiring for open circuit between 4 -pin connector terminal 1 and current supply relay for Motronic (main relay) using Electrical Wiring Diagrams.

  Wire resistance: max. 1.5 ohm

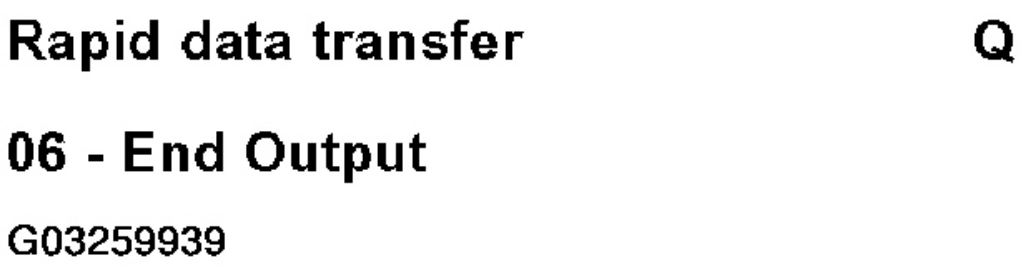

Fig. 12: Identifying Ignition Coil 4-Pin Harness Connector Terminals
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Check wiring between 4 -pin connector and Ground (GND) for open circuit according to Electrical Wiring Diagrams.
  - Terminal 2 and Ground (GND)
  - Terminal 4 and Ground (GND)

  Wire resistance: max. 1.5 ohm

  If there is no malfunction in the supply voltage:

- Check activation, see **CHECKING ACTIVATION** .

Checking activation

WARNING: During the following test do not touch the connecting parts of the ignition coils or test cables.

- Pull fuse No. 32 out of fuse holder.

NOTE: Removing fuse 32 interrupts the voltage supply to the fuel injectors. Fuse holder is located behind access panel at far left end of dash.

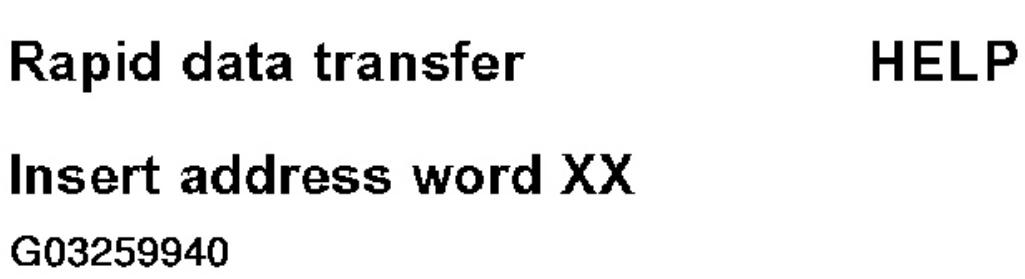

Fig. 13: Locating Fuse 32
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Connect V.A.G 1527 B voltage tester with adapter cables from V.A.G 1594 C to terminals of disconnected connector

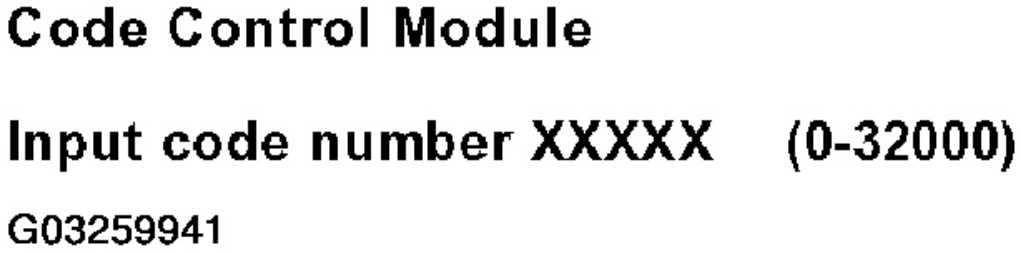

Fig. 14: Identifying Ignition Coil 4-Pin Harness Connector Terminals
Courtesy of VOLKSWAGEN OF AMERICA, INC.

  - Contacts 2 + 3
- Operate starter and check ignition signal from Engine Control Module.

  LED must flicker

- Switch off ignition.

When the LED flickers and the supply voltage is OK:

- Using removal tool T40039, replace ignition coil with power output stage, see item 2 .

- Check DTC Memory, if necessary, repair any malfunctions and then Erase DTC Memory, see **DTC MEMORY OF MOTRONIC ENGINE CONTROL MODULE (ECM) -J220-, CHECKING AND ERASING** .
- Read readiness code, see **READINESS CODE, DISPLAYING** . If DTC memory has been erased or Engine Control Module was disconnected from battery positive, readiness code must be generated again, see **READINESS CODE, GENERATING** .

  The LED does not flicker:

- Check wiring, see **CHECKING WIRING** .

Checking wiring

- Remove inner plenum chamber cover, left:

  See **PLENUM CHAMBER INNER COVER, REMOVING AND INSTALLING**

- Connect V.A.G 1598/31 test box to control module wiring harness. Engine Control Module is not connected by this action.

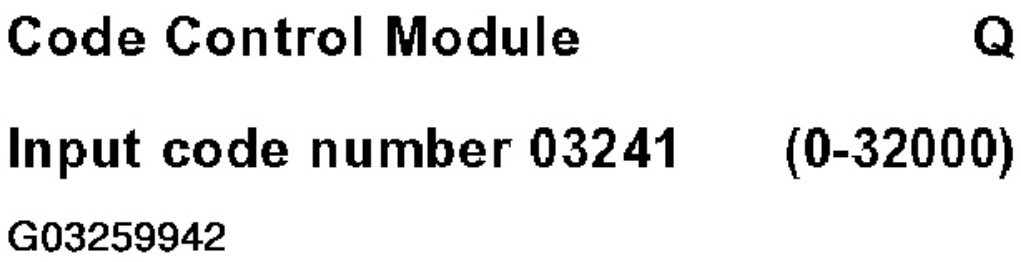

Fig. 15: Connect V.A.G 1598/31 Test Box To Control Module Wiring Harness
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Check wiring between test box and 4 -pin connector for open circuit according to Electrical Wiring Diagrams.

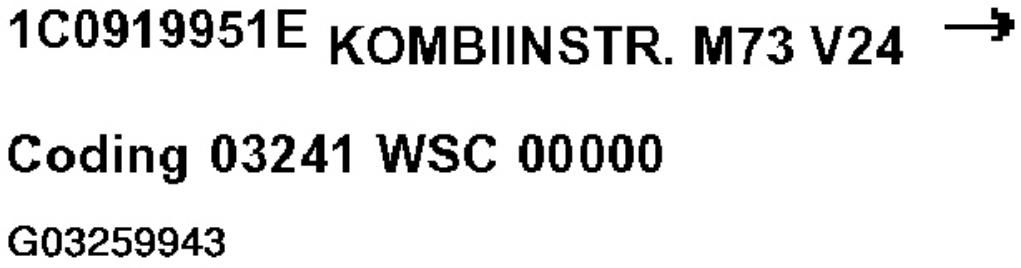

Fig. 16: Identifying Ignition Coil 4-Pin Harness Connector Terminals
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Cylinder 1 terminal 3 + socket 102
- Cylinder 2 terminal 3 + socket 95
- Cylinder 3 terminal 3 + socket 103
- Cylinder 4 terminal 3 + socket 94
- Wire resistance: Max. 1.5 ohm

- Additionally check wires for short to one another.

  Specification: ohm

  If no malfunction can be found in the wiring:

- Replace Engine Control Module (ECM), see **MOTRONIC ENGINE CONTROL MODULE (ECM) -J220-, REPLACING** .

Knock Sensors (KS), checking

NOTE:

- **It is extremely important to keep to the tightening torque of 20 Nm to ensure the Knock Sensors (KS) perform perfectly.**
- **Knock Sensors (KS) 1 -G61- and 2 -G66- have a direct 2 -pin connector and consequently no terminal for the shielding in the connector**
- **Only gold-plated terminals may be used when servicing the Knock Sensor (KS) connector terminals.**
- **Contact surfaces between Knock Sensor (KS) and cylinder block must be free of corrosion, dirt and grease.**

Special tools, test equipment and auxiliary items

- V.A.G 1551 scan tool (or V.A.G 1552 mobile scan tool) with V.A.G 1551/3B cable
- V.A.G 1598/31 test box
- V.A.G 1526 A or Fluke 83 multimeter
- V.A.G 1594 C adapter set
- Electrical Wiring Diagrams

Test conditions

- On Board Diagnostic (OBD) must have recognized a malfunction in one or both Knock Sensors (KS), see **DTC MEMORY OF MOTRONIC ENGINE CONTROL MODULE (ECM) -J220-, CHECKING AND ERASING**
- Engine Coolant Temperature must be at least 85 ° C display group 28, display zone 3

Checking function

- Connect V.A.G 1551 scan tool (or V.A.G 1552 scan tool). Start engine and select "Address word" 01 of Engine Control Module. Engine must be running at idle speed. Connecting scan tool and selecting Engine Control Module, see **VAG 1551, CONNECTING AND SELECTING MOTRONIC ENGINE CONTROL MODULE (ECM) -J220-** .

  Indicated on display

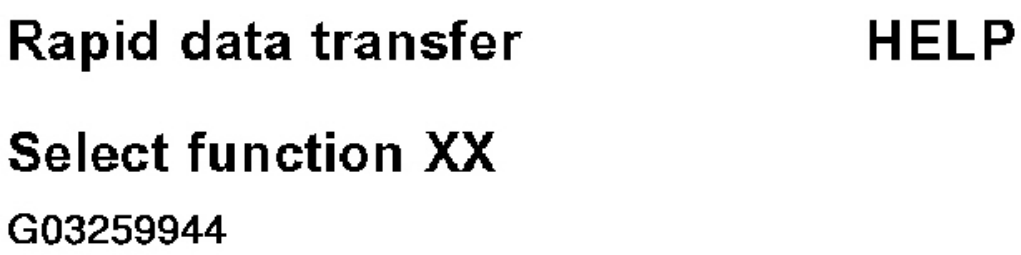

Fig. 17: Identifying Scan Tool Display - Knock Sensors, Checking (1 Of 3)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Press buttons -0- and -8- for the function "Read measured value block" and confirm entry with -Q- button.

  Indicated on display

Fig. 18: Identifying Scan Tool Display - Knock Sensors, Checking (2 Of 3)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Press buttons -0-, -2- and -8- for the "Display group number 28" and confirm entry with -Q- button.

Indicated on display (1--4 - Display zones)

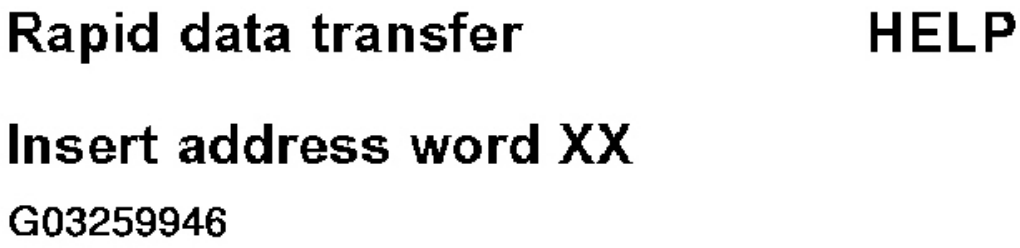

Fig. 19: Identifying Scan Tool Display - Knock Sensors, Checking (3 Of 3)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

NOTE: Checking the Knock Sensors (KS) must be performed during a road test because the Knock Sensors (KS) OBD is not activated until the engine speed exceeds 2000 RPM and the engine is loaded by more than 40%.

- Perform a road test and check knock control specifications on display (display zone 4).

Observe the valid safety precautions when road testing, see **SAFETY PRECAUTIONS** .

DISPLAY GROUP 28: IGNITION, KNOCK CONTROL SPECIFICATION

Display zones				
1		**2**	**3**	**4**
Display group 28: ignition, knock control				
Display	xxxx RPM	xxx.x %	xxx.x °C	Test OFF/Test ON Syst. OK. Syst. n. OK.
Indicated	Engine speed (in steps of 40)	Engine load	Engine Coolant Temperature	OBD condition and OBD result
Working range	0 to 6800 RPM	0.0 to 175.0%	-40.0 to 115.0 ° C	-
Specification	at least 2200 RPM	> 40.0%	85.0 to 115.0 ° C	Syst. OK.
-		-	-	If the specifications are not achieved, see **CHECKING WIRING** , Continuation

If the specification is obtained:

- Press --> button.
- Press buttons -0- and -6- for function "End output" and confirm entry with -Q- button.
- Switch off ignition.

Continuation:

If the specifications are not obtained:

- Press --> button.
- Press buttons -0- and -6- for function "End output" and confirm entry with -Q- button.
- Switch off ignition.

Checking resistance of Knock Sensors (KS)

- Disconnect 2-pin harness connector to Knock Sensor (KS) 1 - G61- (item no. 1) and/or 2-pin harness connector to Knock Sensor (KS) 2 -G66- (item no. 7).

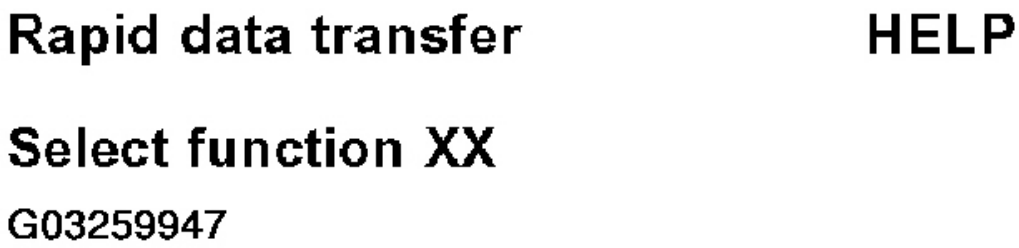

Fig. 20: Disconnecting 2-Pin Knock Sensor Harness Connectors
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Measure resistance between the terminals 1 + 2 at connections to Knock Sensors (KS).

Specification: ohm

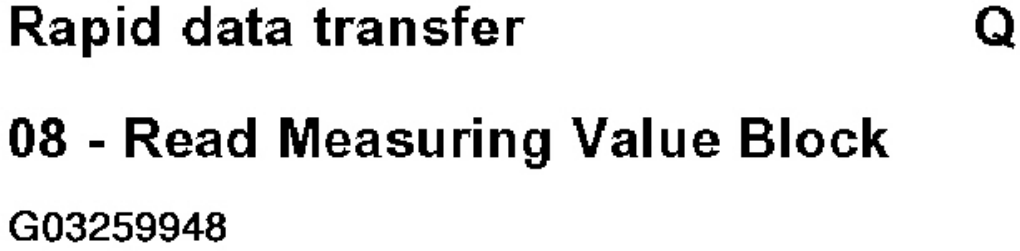

Fig. 21: Measuring Resistance Between Knock Sensor Terminals
Courtesy of VOLKSWAGEN OF AMERICA, INC.

If the specification is not obtained:

- Replace Knock Sensors (KS) -G61- or -G66-, see item 12 or item 13 .
- Check DTC Memory, if necessary, repair any malfunctions and then Erase DTC Memory, see **DTC MEMORY OF MOTRONIC ENGINE CONTROL MODULE (ECM) -J220-, CHECKING AND ERASING** .
- Read readiness code, see **READINESS CODE, DISPLAYING** . If DTC memory has been erased or Engine Control Module was disconnected from battery positive, readiness code must be generated again, see **READINESS CODE, GENERATING** .

If the specification is obtained:

- Check wiring, see **CHECKING WIRING** .

Checking wiring

- Remove inner plenum chamber cover, left:

See **PLENUM CHAMBER INNER COVER, REMOVING AND INSTALLING** .

- Connect V.A.G 1598/31 test box to control module wiring harness. Engine Control Module is not connected by this action.

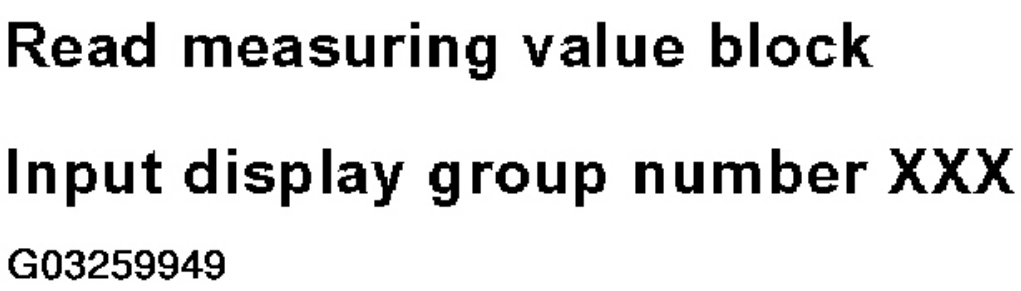

Fig. 22: Connecting V.A.G 1598/31 Test Box To Control Module Wiring Harness
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Check wiring between test box and 2 -pin connector for open circuit using Electrical Wiring Diagrams.

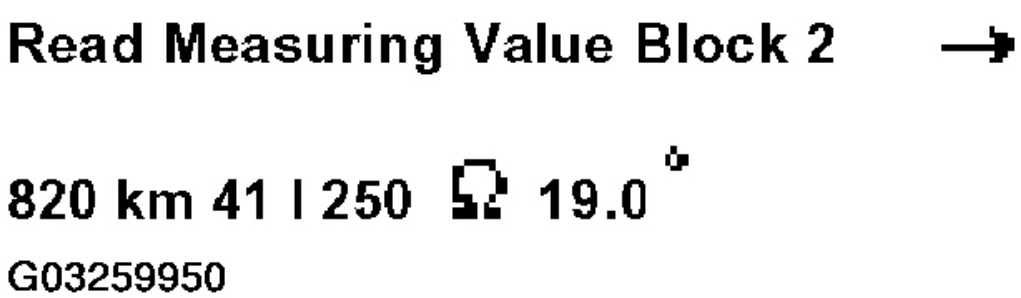

Fig. 23: Identifying Knock Sensor Harness Connector Terminals
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Knock Sensor -G61-: -G66-:

Contact 1 + socket 106 107

Contact 2 + socket 99 99

Wire resistance: Max. 1.5 ohm

- Additionally check wires at socket 99 for short to sockets 106 and 107.

Specification: ohm

If no malfunctions in wiring are detected:

- Loosen Knock Sensor (KS) and tighten again to 20 Nm.
- Perform a road test again and check knock control specifications on display.

  Observe the valid safety precautions when road testing, see **SAFETY PRECAUTIONS** .

  During the road test Engine Coolant Temperature must exceed 85 ° C

  When the temperature is reached, these operating conditions must be obtained several times:

  - Idle
  - Part throttle
  - Full throttle
  - Overrun
  - At full throttle the engine speed must exceed 3500 RPM.
- Again check control module DTC memory.

If the malfunction is still present:

- Replace Knock Sensors (KS) -G61- or -G66-, see item 12 or item 13 .
- Check DTC Memory, if necessary, repair any malfunctions and then Erase DTC Memory, see **DTC MEMORY OF MOTRONIC ENGINE CONTROL MODULE (ECM) -J220-, CHECKING AND ERASING** .
- Read readiness code, see **READINESS CODE, DISPLAYING** . If DTC memory has been erased or Engine Control Module was disconnected from battery positive, readiness code must be generated again, see **READINESS CODE, GENERATING** .

Misfiring recognition, checking

Special tools, test equipment and auxiliary items

- V.A.G 1551 scan tool (or V.A.G 1552 mobile scan tool) with V.A.G 1551/3B cable

Test conditions

- Engine is OK mechanically.
- No DTCs must be stored in DTC memory, see **DTC MEMORY OF MOTRONIC ENGINE CONTROL MODULE (ECM) -J220-, CHECKING AND ERASING**

Test sequence

- Connect V.A.G 1551 scan tool ((V.A.G 1552). Start engine and select "Address word" 01 of Engine Control Module. Engine must be running at idle speed. (Connecting scan tool and selecting Engine Control Module, see **VAG 1551, CONNECTING AND SELECTING MOTRONIC ENGINE CONTROL MODULE (ECM) -J220-**).

  Indicated on display

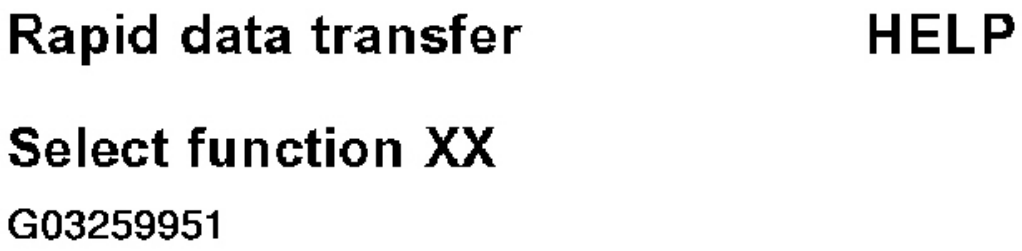

Fig. 24: Identifying Scan Tool Display - Misfiring Recognition, Checking (1 Of 3)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Press buttons -0- and -8- for the function "Read measured value block" and confirm entry with -Q- button.

Indicated on display

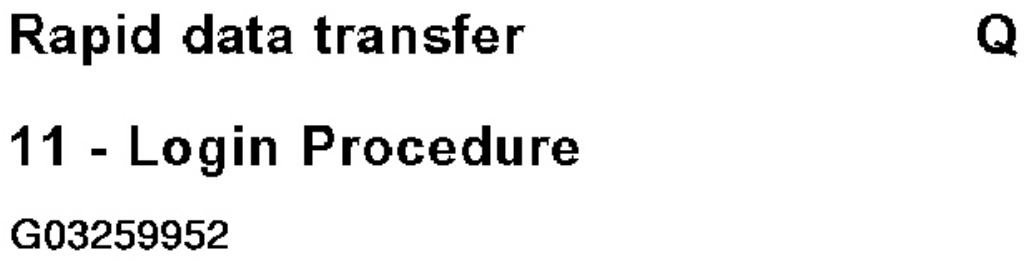

Fig. 25: Identifying Scan Tool Display - Misfiring Recognition, Checking (2 Of 3)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Press buttons -0-, -1- and -4- for "Display group number 14" and confirm entry with -Q- button.

  Indicated on display (1--4 - Display zones)

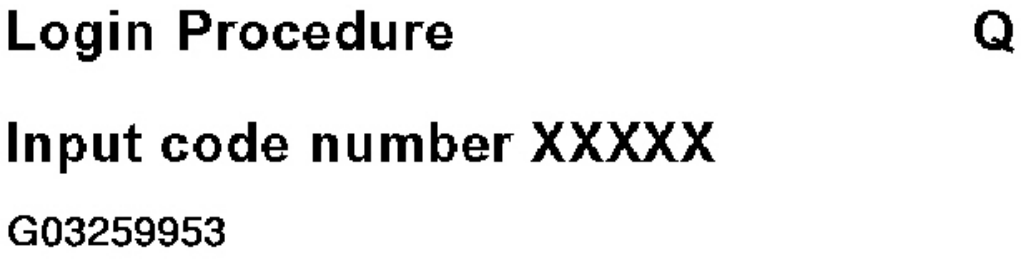

Fig. 26: Identifying Scan Tool Display - Misfiring Recognition, Checking (3 Of 3)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Check total number of misfires in display zone 3.
- Check misfire recognition status in display zone 4.

DISPLAY GROUP 14: IGNITION, MISFIRE RECOGNITION SPECIFICATION

Display zones					
1		**2**	**3**	**4**	
Display group 14: ignition, misfire recognition					
Display	xxxx RPM	xxx.x %	xxx	Activated	

				Blocked	
Indicated	Engine speed	Engine load	Catalyst damaging	Misfire recognition	
(in 40 steps)		misfires (Total)			status
Working range: 0 to 6800 RPM: 0.0 to 175.0%			0 to 65000	-	
Specification	-	> 12.0%	0	activated	

If the specification is not obtained, see **Evaluating display group 14, display zone 3 - total number of catalyst damaging misfires**

If the specifications are obtained:

- Press --> button.
- Press buttons -0- and -6- for "End output" function and confirm input with -Q- button.
- Switch off ignition.

If the specifications are not obtained:

- Change to display group 15 as follows:
- Press button -3- ((V.A.G 1551 scan tool) or button UPARROW (V.A.G 1552 scan tool).

Indicated on display (1--4 - Display zones)

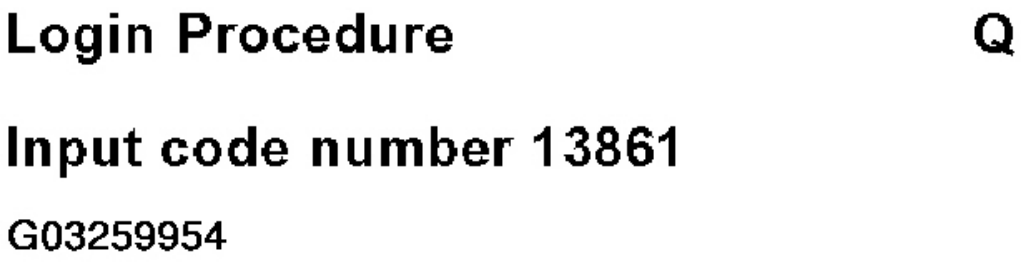

Fig. 27: Identifying Scan Tool Display - Read Measured Value Block 15
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Check misfiring in display zones 1 to 3.
- Check misfire recognition status in display zone 4.

DISPLAY GROUP 15: IGNITION, MISFIRE RECOGNITION

Display zones			

1		2	3	4
Display group 15: ignition, misfire recognition				
Display	xxx	xxx	xxx	Activated Blocked
Indicated	Catalyst damaging	Catalyst damaging	Catalyst damaging	Misfire recognition
misfires Cyl. 1		misfires Cyl. 2	misfires Cyl. 3	status
Working range	0--65000	0--65000	0--65000	-
Specification	0	0	0	activated

If the specification is not obtained, see **Evaluating display group 15 display zones 1 to 3 and display group 16 display zone 1 - total number of catalyst damaging misfires Cyl. 1 to Cyl. 4**

If the specifications are obtained:

- Change to display group 16 as follows:
- Press button -3- ((V.A.G 1551 scan tool) or button UPARROW (V.A.G1552 scan tool).

  Indicated on display (1 and 4 - Display zones)

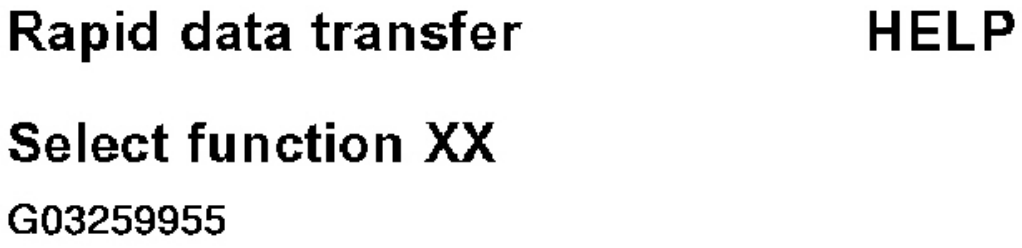

Fig. 28: Identifying Scan Tool Display - Read Measured Value Block 16
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Check misfiring in display zone 1.
- Check misfire recognition status in display zone 4.

DISPLAY GROUP 16: IGNITION, MISFIRE RECOGNITION

Display zones				
1		**2**	**3**	**4**
Display group 16: ignition, misfire recognition				
Display	xxx	-	-	Activated Blocked

Indicated	Catalyst damaging misfires Cyl. 4	-	-	Misfire status recognition
Working range	0--65000	-	-	-
Specification	0	-	-	activated

If the specification is not obtained, see **Evaluating display group 15 display zones 1 to 3 and display group 16 display zone 1 - total number of catalyst damaging misfires Cyl. 1 to Cyl. 4**

- Press --> button.
- Press buttons -0- and -6- for "End output" function and confirm input with -Q- button.
- Switch off ignition.

Evaluating display group 14, display zone 3 - total number of catalyst damaging misfires

EVALUATING DISPLAY GROUP 14, DISPLAY ZONE 3 - TOTAL NUMBER OF CATALYST DAMAGING MISFIRES

Appears on display	Possible malfunction cause	Malfunction elimination
> 0	• Spark plug malfunctioning • Ignition coil with power output stage malfunctioning	• Check spark plugs, see **IGNITION/GLOW PLUG SYSTEM** • Check ignition coils with power output stage, see **IGNITION COILS WITH POWER OUTPUT STAGE, CHECKING**
	• Fuel injector malfunctioning	• Check fuel injectors, see **FUEL INJECTORS, CHECKING**

Evaluating display group 15 display zones 1 to 3 and display group 16 display zone 1 - total number of catalyst damaging misfires Cyl. 1 to Cyl. 4

EVALUATING DISPLAY GROUP 15 DISPLAY ZONES 1 TO 3 AND DISPLAY GROUP 16 DISPLAY ZONE 1 - TOTAL NUMBER OF CATALYST DAMAGING MISFIRES CYL. 1 TO CYL. 4

Appears on display	Possible malfunction cause	Malfunction elimination
> 0	• Spark plug malfunctioning • Ignition coil with power output stage malfunctioning • Fuel injector malfunctioning	• Check spark plugs, see **IGNITION/GLOW PLUG SYSTEM** • Check ignition coils with power output stage, see **IGNITION COILS WITH POWER OUTPUT STAGE, CHECKING** • Check fuel injectors, see **FUEL INJECTORS, CHECKING**